diminished considerably, and the situation now seems to be more satisfactory. The shower of ashes has ceased to pour on Naples. The atmospheric conditions are unfavourable, and the seismic instruments last night registered several earthquake shocks. A steamer with 1000 persons on board left Capri this morning for Naples, but was unable to reach her destination, as when about a mile off the coast the passengers were nearly suffocated by falling cinders and ashes, and the vessel has anchored here so as to enable the passengers to witness the eruption.

Vesuvius Observatory, 6.30 p.m.—Report from Prof. Mattucci:—"The explosive activity of Vesuvius, which was very great yesterday and was accompanied by very powerful electric discharges, diminished yesterday evening. During the night the expulsion of rocks ceased, but the emission of sand increased, completely enveloping me and forming a bed more than ten centimetres deep, which carried desolation into this elevated region. Masses of sand gliding along the earth created complete darkness until 7 o'clock. Several blocks of stone broke windows of the observatory. Last night the earthquake shocks were stronger and more frequent than yesterday, and displaced the seismic apparatus. Yesterday afternoon and this morning torrents of sand fell. While I am telegraphing several balls of fire rise with loud rumbling from the enlarged craters and the new elevated crevasses."

April 10.—Report from Prof. Mattucci:—"Last night was calm except for a few explosions of considerable force from time to time. At 4 o'clock this morning the explosions became more violent. The seismic instruments of the observatory record strong disturbances in the interior of the mountain." The roof of the market of Monte Oliveto, Naples, fell in, on account of the accumulation of volcanic ash upon it.

NOTES.

At a meeting of the council of the Royal College of Surgeons of England held on April 5, the Walker prize of 100*l*., founded by the late Mr. C. C. Walker to encourage investigation into the pathology and therapeutics of cancer, was awarded to Prof. C. O. Jensen, of Copenhagen. The committee appointed to advise the council in reference to the award of the prize was influenced, not merely by the actual work which Prof. Jensen has done in investigating the nature of cancer and the effect of treatment upon it, but also by the extent to which he has opened up a field of research to those engaged in the study of cancer on certain lines, enabling them to carry out their investigations over longer periods of time and under better and more determined conditions than have up to the present time been possible. The Jacksonian prize for 1905 was awarded to Mr. R. C. Elmslie for his essay on "The Pathology and Treatment of Deformities of the Long Bones due to Disease occurring during and after Adolescence." The prize-subject for the year 1907 will be "The Operative Surgery of the Heart and Lungs, including the Pericardium and the Pleura." The subject selected for essays to be submitted in competition for the Cartwright prize for the period 1906–1910 was "Prevention of Dental Caries." The honorary medal of the college was awarded to Lieut.-Colonel Sir Richard Havelock Charles, I.M.S., in appreciative recognition of his gift of anthropological specimens—an addition to the museum of special value and importance, not only on account of the number and variety of the specimens presented, but also because of the authentic particulars attached to them.

At a meeting of the Royal Geographical Society on Monday, Mr. Whitelaw Reid, the United States Ambassador, presented to Captain R. F. Scott, R.N., C.V.O., the gold medal of the American Geographical Society, in recognition of his sledge journey on Antarctic ice and the work of the National Antarctic Expedition.

The secretary to the Post Office has informed the Decimal Association that letters addressed to France and Germany, weighing more than ½ oz. but not more than 15 grams, if only stamped 2½*d*., are not surcharged. Although the difference in weight is but small (about 5 per cent.), still the fact should be generally known, because letters are frequently stamped with 5*d*. which, under this ruling of the Post Office, would go for 2½*d*.

Courses of instruction in oceanic research will be held, as in former years, in Bergen, during the university vacation (August 8 to October 15), mainly on the lines previously adopted. The courses will consist partly of lectures, partly of practical instruction and assistance in laboratory work; excursions will also be made, during which the use of various appliances and instruments will be practically demonstrated. The course will be conducted by Dr. A. Appellöf, Dr. D. Damas, Mr. B. Helland-Hansen, Mr. E. Jørgensen, and Mr. C. F. Kolderup. Anyone desiring to attend the course should make application to the Oceanographical Institute of Bergen Museum, Bergen, Norway, before July 1.

A deputation waited upon Mr. Lloyd-George, M.P., President of the Board of Trade, on Monday to urge the necessity for further amendment of the patent law by legislation which would enforce in the United Kingdom the forfeiture of all British patents for inventions which were worked without, but not within, the United Kingdom, after the lapse of three years from the date of application in the country of origin unless the patentee could justify his inaction to the Board of Trade. In the course of his reply to the views placed before him by members of the deputation, Mr. Lloyd-George pointed out that the Patent Act of 1902 embodied the principle of compulsory working, and he wished to know where the Act had broken down. He thought it necessary to see that, while the commercial community was protected, protection was also afforded to those poor people who, while they have the brains, have not the cash to enjoy the full benefit of their ingenuity.

A committee has been appointed to inquire into and report upon matters connected with the Department of Agriculture and Technical Instruction for Ireland. The committee is constituted as follows:—Sir Kenelm Digby, late Under-Secretary for the Home Department (chairman); the Hon. John Dryden, late Minister of Agriculture in Ontario; Mr. W. L. Micks, member of the Local Government Board for Ireland; Mr. F. G. Ogilvie, principal assistant-secretary for technology in the Board of Education; and Mr. Stephen Brown, chairman of the Kildare County Council. The committee is to inquire whether the provisions of the Agriculture and Technical Instruction (Ireland) Act, 1899, constituting the department, and the methods which the department has followed in carrying out those provisions, have been shown by experience to be well suited to the conditions of Ireland; whether any, and if so what, changes are desirable in those provisions and methods; and to report also upon the relations of the department to the Council of Agriculture, to the Agricultural Board, and to the Board of Technical Instruction; upon its relations to local statutory bodies; upon the funds at its disposal and the modes of employing them, and upon its position in regard to other departments, especially those charged with educational functions.

From the April number of the *Popular Science Monthly* we learn that the regents of the Smithsonian Institution have passed a resolution expressing their profound sorrow at the death of Dr. S. P. Langley, secretary of the institution from 1887 to his death. The resolution includes the following appreciative record of Dr. Langley's work:—"In the death of Mr. Langley this institution has lost a distinguished, efficient, and faithful executive officer, under whose administration the international influence of the parent institution has been greatly increased, and by whose personal efforts two important branches of work have been added to its care—the National Zoological Park and the Astrophysical Observatory. The scientific world is indebted to Mr. Langley for the invention of important apparatus and instruments of precision, for numerous additions to knowledge, more especially for his epoch-making investigations in solar physics, and for his efforts in placing the important subject of aërial navigation upon a scientific basis. All who sought the truth and cultivated science, letters, and the fine arts, have lost through his death a co-worker and a sympathiser." The executive committee has been requested to arrange for a memorial meeting to be held in Washington; and Dr. A. D. White has been invited to prepare a suitable memorial which shall form a part of the records of the Board of Regents of the institution.

THE belemnites of the Speeton Clay form the subject of a paper by Mr. T. Shepherd, issued as No. 29 of Hull Museum Publications.

WE have received a copy of a fourth supplement to "A Catalogue of the Books in the Library of the Indian Museum," containing additions from the autumn of 1899 to that of 1903.

IN No. 1440 of the Proceedings of the U.S. National Museum, Mr. Knud Andersen describes horseshoe-bats collected in the islands of Nias and Engano, Malay Archipelago. No. 1441 of the same serial is devoted to a revision of American Palæozoic insects, by Mr. Anton Handlirsch, of the Imperial Natural History Museum at Vienna, to whom the Transatlantic specimens have been sent. A large part of the collection was obtained from the Upper Carboniferous shales of Mazon Creek, in Illinois, where they are found imbedded in washed-out nodules. Since only about one nodule in a thousand contains an insect's wing, the search would be impossible were it not for the fact that other fossils are comparatively common. Owing to ill-health, Prof. Scudder was unequal to the task of describing the collections, and it was for this reason that they were handed over to the Austrian palæontologist. The systematic conclusions reached by Mr. Handlirsch differ somewhat from those of Prof. Scudder, and render insect phylogeny simpler. The order of Palæodictyoptera, which is the oldest, is regarded as the ancestral stock from which all other insects are descended. In No. 1439 of the same serial Mr. Handlirsch describes a new and interesting type of cockroach from the Cretaceous beds of the Judith River, Montana.

PARTS iv. and v. of vol. xvi. of the Proceedings of the Royal Physical Society of Edinburgh have been received. The former is entirely devoted to a catalogue of the crustaceans of the Forth area, by Dr. T. Scott; while certain rotifers from the same district form the subject of a paper in No. 5, by Mr. J. Murray. The latter issue also contains an important paper by Prof. J. G. Kerr on the embryology of certain primitive fishes, more especially the lung-fishes and fringe-finned ganoids. As the result of his investigations, the author concludes that vertebrate limbs are probably modified external gills, the theory that they are derivatives from a pair of lateral skin-folds being, in his opinion, purely hypothetical, and not supported by embryological evidence. According to Prof. Kerr's view, two pairs of the primitive gills lost their respiratory function and assumed a motor one, developing at first into "stylopterygia," then into the "archipterygia" of Ceratodus, and finally, but independently, into "chiropterygia." This implies the theory that the archipterygium is really the primitive type of fin, and also involves the acceptance of Gegenbaur's idea that limb-girdles represent branchial arches. The limbs of Lepidosiren and Protopterus are regarded as reversions to the stylopterygian type. Further, the author asserts his belief in the intimate relationship between lung-fishes and salamanders. Dollo's theory that the diphycercal tail of modern lung-fishes is derived from a heterocercal type is considered improbable.

WE have received copies of the *Sitzungsberichte* of the Royal Bohemian Academy of Sciences for 1904 and 1905. One of the most interesting articles in the former of these is an account, by Dr. G. Eisen, of the now extinct Indians of the Santa Barbara Islands, off the Californian coast. Our knowledge of these Indians is derived from the accounts of the early voyagers, from the missionaries who subsequently settled on the islands, and from the remains in their refuse-heaps and the skulls and skeletons which have from time to time been collected. Some of the islands probably at one time had a population approaching 1000 each, but in 1823 only about 900 were left on Santa Barbara and the neighbouring islets; and by 1875 all had disappeared, the last survivor in San Nicolas having been deported in 1853. Although they manufactured a certain number of domestic utensils, these Santa Barbara Indians are described by the missionaries as the most degraded of all human beings, with a morality lower than that of animals. Insects, especially grasshoppers, formed a portion of their food, and, like the natives of the adjacent mainland, they probably fed to a great extent on the larger kinds of earthworms. Possibly they belonged to the Shoshonean stock of the mainland. Their extermination is attributed to the changed conditions of existence imposed upon them by the missionaries.

IN *Science* for March 9 and 16 several papers on yellow fever, read before the American Association for the Advancement of Science, are reported. Prof. Calkins discusses the protozoan life-cycle, and concludes that the yellow-fever microbe probably belongs to the spirochætes. Mr. J. H. White summarises the practical results of discoveries on yellow fever transmission, Mr. H. C. Weeks discusses the practical side of mosquito extermination, and Dr. J. Carrol, in a paper entitled "Without Mosquitoes there can be no Yellow Fever," reviews the evidence, showing that yellow fever is conveyed solely by the mosquito *Stegomyia fasciata*.

IN the first number of the *Philippine Journal of Science*, issued in January, Mr. E. B. Copeland, discussing the water relations of the coco-nut palm, attributes much value to an open position where transpiration is considerable and the trees receive full illumination. These observations would help to explain the fact that coco-nut trees growing near the sea shore produce more fruit than those growing further inland, although analyses show very little differences in the composition of the soils.

THE second number of the *Philippine Journal of Science* (i., No. 2) maintains the high standard of its predecessor. Mr. H. S. Walker discusses the keeping qualities of coco-nut oil and the causes of its rancidity; the latter seems to be due to the growth of moulds in imperfectly dried copra. Mr. C. S. Banks describes and illustrates the principal insects attacking the coco-nut palm, and Mr. A. M. Clover writes on Philippine wood oils. Mr. W. D. Smith describes certain Orbitoides from the Binangonan limestone, and Dr. R. Strong experiments on vaccination against plague. Mr. M. Herzog details an investigation on beri-beri, from cases of which he has succeeded in isolating the kakke coccus of *Okata kokubo*.

In the *Bulletin du Jardin impérial botanique* of St. Petersburg (vol. vi., part i.) Mr. A. Elenkin puts forward the view that in lichens the algal and fungal constituents do not exist for mutual benefit, but, being differently acted on by external factors, one flourishes at the expense of the other. Mr. B. Issatchenko, writing on the conditions under which chlorophyll is formed, dissents from the results obtained by Mr. W. Palladin that a concentration of 35 per cent. to 50 per cent. of sugar prevents its formation. Mr. P. Isuzew announces that he has found trees of the bird-cherry with rose-coloured flowers in the province of Perm, and also that early and late flowering varieties were observed growing side by side.

In the *West Indian Bulletin*, vol. vi., No. 4, a number of papers on sugar and sugar cultivation are collected from which a fair idea of the state of the industry in the West Indies can be obtained. While it cannot be said that the industry has been as yet re-established on a sound basis, the opinions expressed by such capable judges as Sir Daniel Morris, Dr. F. Watts, and Dr. H. H. Cousins all point to a successful future if only planters will take advantage of the improved varieties, and if separately or in combination they will arrange for the establishment of factories equipped with modern machinery. New seedlings giving a higher proportion of saccharose are being evolved; the well known seedling B. 208, now under cultivation in Barbados, Jamaica, Queensland, and elsewhere, has been surpassed by another Barbados seedling, B. 1529, and some of the Jamaican seedlings of 1904 promise to give excellent results. The fluctuations of the sugar industry in Antigua and St. Kitts during the last twenty-five years can be readily followed from the diagrams given by Dr. F. Watts.

An important contribution to the subject of foliar periodicity in tropical countries is provided by Mr. H. Wright in the Annals of the Royal Botanic Gardens, Peradeniya, vol. ii., part iii., 1905, recording a large number of interesting observations. Contrasting the influence of internal and external factors, two arguments in favour of the former are found in the small number of species that pass through a leafless period each year, and the striking fact that there is not a month in the year when all the deciduous species are in full leaf. On the other hand, since more than half the deciduous species pass through their leafless phase during the dry period from January to March, it is obvious that climate has considerable influence on periodicity. Of the physical factors that produce climate, Mr. Wright attributes the greatest importance to humidity. In this connection, the curves of monthly variations of temperature, rainfall, and humidity placed alongside the curve indicating the number of deciduous species in each month are especially instructive.

A very elaborate discussion of the climate of Beyrout, Syria, has been undertaken by Dr. S. Kostlivy, and published by the Royal Bohemian Society of Sciences. Since the year 1876 the observations have been regularly printed in the year-books of the Austrian Meteorological Service; the discussion in question refers to the twenty-five years 1876–1900. We can only briefly mention some of the principal results of Dr. Kostlivy's valuable work. The yearly variation of the monthly means of atmospheric pressure is considerable; the highest monthly mean was in January, 1898, 30·18 inches; the lowest in July, 1893, 29·70 inches, the mean variation being about half an inch. The highest monthly mean temperature occurs in August, 81°·5, the lowest in January, 55°·4. The absolute extremes were 101°·3, in October, 1898, and 30°·0, in December, 1897. The mean annual rainfall is 35·65 inches; of this amount 59·8 per cent. falls in winter, 18·5 per cent. in spring, 0·7 per cent. in summer, and 21·0 per cent. in autumn. During the whole series of twenty-five years, no rain fell in August in twenty-two cases, and none in July in twenty cases. The greatest fall in twenty-four hours was 5½ inches, in October. Snow is unknown at Beyrout, but hail occurs, on an average, on six or seven days in each year. Fog occurs very rarely; it was only observed on nineteen days during the whole period. The most prevalent wind is from the south-west, being about 31 per cent. of the whole of the wind notations; stormy days occur, on an average, only about seven times a year.

The Meteorological Office has issued its "Annual Summary" for 1905, based upon observations made at 153 stations in the United Kingdom; it contains an interesting account of the conspicuous meteorological occurrences during the year. There was a remarkable absence, after the first three months, of gales which affected any large extent of country; during the three months ending with July no general gale was experienced on our coasts. The most violent storm of the year occurred on March 15; it came on with remarkable suddenness, and at Falmouth one of the gusts reached a velocity of 103 miles. Strong gales were also experienced in the last three months of the year. Rainfall was deficient over the kingdom generally, the loss being from 10 inches to 13 inches at some places; but at several stations in Scotland and Ireland the rainfall was above the average, and at Dungeness an excess of 8 inches was recorded. There was no snowstorm worthy of special mention, although snow was of frequent occurrence in the first months of the year. Thunderstorms were recorded in every month in some part of the country, but the distribution was very irregular. The most remarkable droughts occurred in the winter season; a period of dry weather which set in about the middle of December, 1904, was maintained with but unimportant interruptions until the middle of February, 1905. May was also a very dry month over an extensive region. The maximum temperature recorded was 87°, at Maidenhead, on July 26; there were many readings of 80° and upwards. The lowest temperatures in England occurred about January 19; at Llangammarch Wells a reading of 11° was registered. In Scotland and Ireland the greatest cold was about November 19; Braemar registered 5°. Fog was prevalent in the mornings from about the middle of October; November had also several foggy days, but the worst visitation of the year occurred from December 10–14. An exceedingly high tide swept down the east coast of England on the night of January 6–7, flooding extensive tracts and causing great destruction of property; it was accompanied with a hard north-westerly gale.

An informal address by Dr. A. G. Bell to the Committee on Coinage, Weights, and Measures of the U.S. House of Representatives on February 16, giving an explanation of the reasons why the United States should abandon its heterogeneous systems of weights and measures, is printed in the *National Geographic Magazine* for March. The committee had under consideration a Bill before Congress proposing that, from July 1, 1908, all the departments of the Government of the United States, in the transaction of business requiring the use of weight and measurement, shall employ and use the weights and measures of the metric system. Dr. Bell gave an exhaustive account of the anomalies of the British systems of measurement in use in the United States. He pointed out that all civilised countries, with the exception of the United States and Great Britain and her colonies, have adopted the simpler and more scientific decimal system. He reminded the committee that the metric system was legalised in the United States in 1866, and that its adoption by a portion of the population had increased the present confusion. By reference to the decimal system of coinage already in use in the States, Dr. Bell provided convincing instances of the simplification possible with it in the conversion of units, and explained that the United States, when it changed from the old system of pounds, shillings, and pence to the present dollars and cents, did not adopt the metric system of weights and measures because the latter, as we know it, did not appear until after the American Coinage Act of 1792. The facts that our whole system of arithmetic is decimal, that no difficulty whatever is experienced by ordinary workmen in the use of the metric system—provided there is no question of converting their measurements—and that the use of the metric system need not mean the use of new tools, were all clearly explained. It is interesting to note, in connection with this Bill before Congress, that the committee on publicity of the Metrological Society, of which Prof. Simon Newcomb is chairman, has circulated a letter urging all persons in favour of the introduction of the metric system to write, and also secure from other friends, as many letters to representatives in Congress as possible, so that they may see that public sentiment is in the direction of the adoption of decimal weights and measures.

IN the Proceedings of the American Academy of Arts and Sciences, xli., 24, for February, Mr. B. O. Pierce describes, with diagrams, experiments on the manner of growth of a current in the coil of a nearly closed electromagnet, as influenced by the width of the air gap.

WE have received part i. of the Transactions of the English Ceramic Society for the session 1905–6, and notice that, in view of the greatly increased activity of the society, it has become necessary to issue its publications in a serial form, instead of in a single volume at the completion of the session, as was formerly the case. The present number contains five papers read before the society during November and December of last year.

OUR ASTRONOMICAL COLUMN.

COMET 1906*c*.—The following extension of Dr. E. Strömgren's ephemeris for comet 1906*c* is taken from Circular No. 88 of the Kiel Centralstelle:—

Ephemeris 12h. Berlin M.T.

1906	α h. m. s.	δ ° ′	log Δ	Brightness
April 10	3 7 6	+13 40	0·2912	0·37
14	3 15 40	+16 19	0·3084	0·31
18	3 23 54	+18 45	0·3249	0·27
22	3 31 52	+20 59	0·3405	0·23
26	3 39 38	+23 4	0·3553	0·20
30	3 47 14	+25 0	0·3693	0·17

Brightness at time of discovery = 1·0 = about mag. 8·0.

This object is now apparently leaving the constellation Aries for that of Taurus, and will pass through the Pleiades group on April 26–27.

In reference to the paragraph on comet 1905*c* on p. 545, where it was stated that that comet, also, would pass near to the Pleiades, the latter name was given in mistake for the Hyades.

MEASUREMENTS OF LINNÉ DURING THE TOTAL ECLIPSE OF THE MOON.—In Circular No. 113 of the Harvard College Observatory, Prof. E. C. Pickering publishes the results of a series of measurements of the bright spot around the lunar crater Linné, made by Mr. R. H. Frost during the total eclipse of the moon which took place on February 8.

These results show that the diameter of the spot began to increase as Linné passed into the earth's shadow, and to decrease rapidly on the return of sunlight to that portion of the moon's surface.

This apparently confirms Prof. W. H. Pickering's theory that the phenomenon is due to the formation and melting of hoar-frost.

THE TEMPERATURE OF THE SUN.—An important paper bearing on the question of the temperature of the sun's surface was communicated to the Paris Academy of Sciences by M. Henri Moissan on March 19.

In the course of his well known experiments with the electric furnace, M. Moissan recently succeeded in distilling titanium, and from the temperature therein employed he deduces probable limits for the temperature in that part of the sun's body where, as seen from the solar spectrum, titanium is volatilised.

The temperature of the arc employed has been previously determined as about 3500° C., and, taking into account the uncertainty as to the pressure existing in the solar atmosphere, M. Moissan concludes that the probable temperature varies between Prof. Wilson's estimated value of 6590° C. and the value obtained by M. Violle, viz. 2000° C. to 3000° C., the probability being that the latter value is nearer to the truth (*Comptes rendus*, No. 12).

THE MELBOURNE OBSERVATORY.—The thirty-ninth annual report of the work done at Melbourne Observatory deals with the period April 1, 1904, to March 31, 1905, its chief point being a statement of the progress of the work in connection with the Astrographic Chart. To this end the astronomical work has been almost entirely confined to meridian observations and stellar photography.

The catalogue series now totals 1149 satisfactory plates, and is complete, whilst for the second catalogue series 455 plates have been obtained. For the chart series, with single exposures of 60m., 565 plates have been passed, thus completing this part of the work. Four hundred and ninety-five plates, with triple exposures of 30m. each, have also been obtained for the chart.

On March 31, 1905, 317 Sydney and 612 Melbourne plates, containing 177,069 and 206,604 stars respectively, had been measured.

The measurement of the long series of magnetic curves extending back for thirty-seven years was nearly completed when the report was issued, 37,212 day-curves out of about 40,000 having been measured.

MOUNTING THE 60-INCH REFLECTOR AT HARVARD.—An interesting description of the method which is being employed in mounting the late Dr. Common's 60-inch reflector at Harvard College Observatory is given in No. 3, vol. xiv., of *Popular Astronomy*.

Instead of being supported on a solid pier, nearly the whole of the weight of the instrument is borne on a cylindrical steel float partly submerged in a tank of water, and so fitted as to be perfectly steady.

The coudé method of mounting has been employed, so that the observer may remain in a comfortably fitted room and make his observations through an eye-piece which retains a constant position and direction.

Electric motors have been employed to drive the telescope, and, by a number of switches conveniently placed in the observing room, the observer is able to maintain full control over all the necessary adjustments.